

LISTING OF THE CLAIMS

1. (Previously Presented) A method of characterizing the biological activity of a candidate compound comprising:

placing one or more cells into an area of observation in a sample well;

exposing said one or more cells to said compound;

repetitively exposing said one or more cells to a series of biphasic electric fields at a rate of approximately 20 to 100 pulses per second;

producing a limited spatial variation in intensity in said electric field in said area of observation of within $\pm 10\%$ from a mean intensity in that area;

producing a controlled change in transmembrane potential predominantly in a single direction away from a starting transmembrane potential during said series of biphasic electric fields due to a continuing and additive accumulation of charge in said one or more cells over the course of said series of electric fields; and

detecting said controlled change in transmembrane potential of said one or more cells by detecting fluorescence emission of a FRET based voltage sensor from an area of observation containing said one or more cells.

2. (Original) The method of Claim 1, wherein said one or more electrical fields cause an ion channel of interest to open.

3. (Original) The method of Claim 1, wherein said one or more electrical fields cause an ion channel of interest to be released from inactivation.

4. (Original) The method of Claim 1, wherein said one or more cells comprise a voltage regulated ion channel.

5. (Original) The method of Claim 4, wherein said voltage regulated ion channel is selected from the group consisting of a potassium channel, a calcium channel, a chloride channel and a sodium channel.

6. (Cancelled)

7. (Original) The method of Claim 1, wherein spatial variation in said one or more electrical fields is within $\pm 1\%$ from the mean electrical field at any one time.

8. (Original) The method of Claim 1, wherein said one or more electrical fields are selected from a square wave-form, a sinusoidal wave-form or a saw tooth wave-form.

9-24. (Cancelled)